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Race-Ethnic Differences in Sexual Health Knowledge

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Abstract (196 words): Despite extensive research examining the correlates of unintended fertility, it remains a puzzle as to why racial and ethnic minorities are more likely to experience an unintended birth than non-Hispanic whites. This paper focuses on sexual literacy, a potential precursor of unintended fertility. Analyses use a unique dataset of unmarried young adults aged 18-29, the 2009 Survey of Unmarried Young Adults' Contraceptive Knowledge and Practices, to examine beliefs regarding pregnancy risks, pregnancy fatalism, and contraceptive side effects. At the bivariate level, foreign-born Hispanics hold more erroneous beliefs about the risk of pregnancy than other groups, and non-Hispanic blacks are more likely to believe in contraceptive side effects than non-Hispanic whites. Both foreign-born Hispanics and non-Hispanic blacks are more likely than non-Hispanic whites to hold a fatalistic view towards pregnancy. Race-ethnic differences are attenuated for pregnancy misperceptions and fatalism in multivariate models controlling for sources of health information, sexual and fertility experiences, and sociodemographic characteristics. However, non-Hispanic blacks remain more likely than non-Hispanic whites to believe there is a high chance of reduced sexual desire and serious health consequences when using hormonal contraceptives. These differences may contribute to race-ethnic variation in contraceptive use and, ultimately, unintended fertility.

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Introduction

Unintended births are associated with negative health outcomes for women, children, and families (Logan, Holcombe, Manlove, and Ryan 2007; Santelli et al. 2003). Despite public health efforts to reduce the rate of unintended fertility, levels remain high in the United States, and there are wide disparities in unintended birth rates by socioeconomic and demographic characteristics (Finer and Zolna 2011; U.S. Dept of Health and Human Services 2000, 2009). In particular, unintended fertility is more common among non-Hispanic blacks and Hispanics than among non-Hispanic white and Asian women (Chandra et al. 2005; Finer and Zolna 2011; Guzman, Wildsmith, Manlove, and Franzetta 2010). Although these differences are longstanding, their causes are not well understood.

Race-ethnic variation in the extent of accurate knowledge about sexual and reproductive health as well as attitudes toward sexuality and fertility – what can be considered an individual's "sexual literacy" (Reinisch and Beasley 1990) – may be an important factor in unintended fertility disparities, yet few studies have adequately examined differences in sexual and reproductive health knowledge across different race-ethnic groups. Our research builds on prior work by examining race-ethnic variation in three components of sexual literacy – accurate knowledge about pregnancy risk, pregnancy fatalism, and perceptions of contraceptive side effects – in a nationally representative sample of unmarried young men and women. We focus on these three components because if people under-estimate the risk of getting pregnant, do not believe that their contraceptive actions will actually affect their chances of pregnancy, and over-estimate the side effects of contraception, they will be less likely to use contraception, particularly more effective hormonal methods. Moreover, we further extend the literature by

examining potential explanatory factors for variation in sexual literacy: sources of health knowledge, sexual beliefs and experiences, and socioeconomic factors.

Reproductive and contraceptive beliefs

At the most basic level, to avoid getting pregnant, one must accurately understand the reproductive process and how to prevent pregnancy. Unfortunately, misinformation about sexual practices and contraception is widespread in the United States (The Henry J. Kaiser Family Foundation 2003; Clark, Baldwin, and Tanner 2007; Schrager and Hoffman 2007). For instance, in a recent content analysis of emails to a reproductive health website, Wynn, Foster, and Trussell (2009) found that more than a quarter of questions sent in reflected misperceptions around sexual and reproductive health processes.

Moreover, even if individuals understand how pregnancy occurs, they are unlikely to use contraception if they believe that using birth control is somehow unnatural or ineffective. Qualitative research from a range of settings in the United States has identified a persistent stream of fatalism in American attitudes toward childbearing (e.g., Bledsoe 1996; Rainwater 1960; Sawhill, Thomas, and Monea 2010). This fatalism includes beliefs such as it is unnatural to plan births, that childbearing takes place when it is "the right time" or "in God's plan," and that efforts to control fertility will be fruitless. Furthermore, given high levels of unintended fertility, many men and women know someone with an unplanned birth but may not know whether the person was using contraception consistently or correctly. These experiences may add to the interpretation that it is futile to try to control childbearing, what we refer to as "pregnancy fatalism."

Finally, when deciding to use contraception and which type of contraception to use, individuals are likely to weigh the costs and benefits of contraception (WHO 1973). Costs

include the obvious direct financial costs and social/relational costs but also include any possible side effects accompanying contraceptives. In general, the most effective reversible contraceptives are hormonal, but they can carry side effects, such as weight gain, nausea, and mood changes. Most of these side effects are quite minor, but the existence of side effects may be sufficient to discourage women from using these methods, especially if women over-estimate the risk and severity of effects. Among women who have had an abortion, concerns over contraceptive side effects are often cited as a reason for discontinuation and non-use (Jones, Darroch, and Henshaw 2002), highlighting the role of beliefs about contraception as a precursor to unintended pregnancy. There are widespread misperceptions regarding the safety, efficacy, and health effects of contraception, which in turn affect method choice, adherence, and discontinuation (Sihvo, Hemminki, and Kosunen 1998; Clark 2001). Long-acting reversible contraceptives (LARCs), such as intrauterine devices (IUDs) and hormonal implants, are especially likely to be misunderstood (Spies et al. 2010).

Race-ethnicity and sexual literacy

In general, minority women are less likely to use hormonal contraceptives than non-Hispanic whites (Welti, Wildsmith, and Manlove 2011), but the reasons behind differential rates of usage are unclear. A number of studies have documented negative attitudes toward contraception and confusion about the reproductive process among non-Hispanic blacks and Latinos. Qualitative research involving Latino and non-Hispanic black teenagers aged 14-19 noted "an enormous amount of erroneous information circulating among these participants, their peers, and others in their environment" regarding contraception (Aarons and Jenkins 2002, p. 17). Misperceptions regarding hormonal contraceptives included an elevated risk of cancer and permanent sterility, among more minor side effects such as irregular bleeding, weight gain,

nausea, low libido, hair loss, and varicose veins (Aarons and Jenkins 2002; Gilliam et al. 2009). Though it is easy to attribute misinformation to the young age of participants in the qualitative studies above, other work suggests that even minority adult women hold misinformation (Gilliam et al. 2004; Shedlin et al. 2011; Venkat et al. 2008). Moreover, there is variation in knowledge across the components of sexual literacy, with different race-ethnic groups concerned about different aspects of reproductive health (Dehlendorf et al. 2010; Venkat et al. 2008). One study of Mexican-origin women found high levels of incorrect beliefs about the reproductive process but generally favorable attitudes toward contraceptive use (Shedlin et al. 2011). In contrast, African Americans seem to exhibit stronger concerns about side effects of contraception, arising in part from a general suspicion about medical institutions linked to a history of discrimination (Thorborn and Bogart 2005).

However, drawing firm conclusions from this body of research in order to understand race-ethnic disparities in unintended fertility is problematic for several reasons. One, the majority of the research uses small and non-representative samples, limiting the generalizability of the findings. Two, much of the work on contraceptive beliefs and attitudes focuses on young teenagers (often as part of work on creating and evaluating sex education programs), but unintended birth rates are highest among women aged 18-19 and 20-24, followed by women 25-29. Young adults in their twenties are more likely to be sexually active than teenagers, yet we know little about the reproductive health and contraceptive knowledge of this age group. Further, many of the studies focus on women (who are generally more informed about the reproductive process and contraception than men (Frost, Lindberg, and Finer 2012)), but men are vital partners in contraceptive use and decision-making (Grady et al. 2010), so information on men's sexual literacy is also important. Finally, the biggest drawback to existing literature is that it

cannot truly contribute to efforts to understand race-ethnic differences in unintended fertility because it does not make comparisons to non-Hispanic whites or Asians. That is, while it seems clear that there is misinformation among disadvantaged minority groups, it is not clear that misinformation is any more prevalent than among non-Hispanic whites or Asians. The disproportionate focus on low-income and urban populations further undermines the ability to determine the causes of race-ethnic variation in unintended fertility because it is not clear whether differences in knowledge are actually issues of socioeconomic status rather than race-ethnicity.

Influences on sexual health knowledge

Diffusion models of social learning and social influence on fertility behaviors suggest that individuals gain information from their social networks, health and school officials, and the mass media (Montgomery and Casterline 1996). Individuals then use this information to make decisions, weighing the opinions of some sources more heavily than others, forming a process of "sexual socialization" (Sharkstall, Santelli, and Hirsch 2007). Because of residential segregation, socioeconomic stratification, and past and present racial discrimination in the United States, both access to different sources of information and evaluations of the relevance of these sources are likely to vary by race-ethnicity, as well as nativity.

Formal sex education in schools may be a source of information, but the rise in abstinence-only education in the United States over the past decade means that many individuals are receiving little or no information on contraception, and sometimes even receiving erroneous information (Santelli et al. 2006; Gusrang and Cheng 2010). Further, non-Hispanic blacks and Hispanics are less likely to receive formal sex education than non-Hispanic whites (Abma et al. 2004). Not surprisingly, then, other sources of information are also important. Research suggests

that minorities tend to rely heavily on their social networks for health information (Dehlendorf et al. 2010). Friends, mothers, and partners tend to be key sources of contraceptive information among non-Hispanic blacks and Hispanics (Blackstock, Mba-Jonas, and Sacajiu 2010; Yee and Simon 2010). Primary care physicians are also often utilized as sources of information (Blackstock, Mba-Jones, and Sacajiu 2010), but many people do not have a primary care physician, particularly those without private insurance. Immigrant groups may be particularly disenfranchised from the health care system, in part due to language and insurance status barriers (Dehlendorf et al 2010; Shedlin et al 2011). Furthermore, distrust of, and discomfort around, the medical establishment is often greater among disadvantaged minorities (The Henry J. Kaiser Family Foundation 2003; Thorman and Bogart 2005; Dovidio et al. 2007) and may lead individuals to discount information from those sources. Media sources, including television and the internet, are also common sources of reproductive health information for young adults. The use of multiple sources creates the potential for conflicting information, requiring individuals to weigh their sources of information. The opinions and experiences of close family members and friends are especially influential among minority women, as "women may be more likely to closely identify with social network members' family planning experiences as they may reflect women's own needs and preferences" (Blackstock, Mba-Jonas, and Sacajiu. 2010, p. 138). Friends', mother's, and sisters' opinions are sometimes considered more valuable than clinicians' recommendations because individuals feel as if they are getting first-hand experience about contraception rather than abstract, impersonal information (Yee and Simon 2010).

Individuals' own sexual and fertility experiences also inform their beliefs about reproductive health and contraception. People who have never had sex may be relatively ignorant of the reproductive process and contraception, while those who entered into sex at early ages

may have lower sexual literacy, if an early age is indicative of a poor understanding of sexual risks (Feldmann and Middleman 2002), or they may have higher sexual literacy if a longer period of sexual experience increases sexual literacy. Those in a current sexual union are at the highest risk of pregnancy; as such, they likely have given more consideration and investigation into the reproductive process and contraception. Individuals who have been pregnant (or gotten someone pregnant) have had more firsthand experience with the reproductive process and have received medical care, so they may have fewer misperceptions. Additional influences may stem from family and friends' more general beliefs about the acceptability of reproductive behavior, such as family support for nonmarital childbearing, friends' experiences of unplanned pregnancies, and friends' belief regarding the importance of birth control. Religiosity likely plays a role, as many religions discourage nonmarital sexual activity and perhaps discussion of sexual behaviors and contraception as well. Thus, the well-documented race-ethnic differences in sexual experiences and attitudes, such as age at first sex (Centers for Disease Control 2008), support for nonmarital childbearing (East 1998; Landale, Schoen, and Daniels 2010), and religiosity (Chatters, Taylor, Bullard, and Jackson 2009; Pew Hispanic Center and Pew Forum on Religion and Public Life 2007), may contribute to differences in sexual literacy.

Finally, socioeconomic status shapes access to sexual health knowledge. Less educated individuals are less likely to have extremely knowledgeable social contacts and are less able to seek out external sources of information. To the extent that race-ethnic minorities and immigrants in the United States are disproportionately disadvantaged, with lower levels of education, they may be less educated about overall health issues and processes. Similarly, there is differential access to health care based on insurance status. Individuals without health insurance may be unable to afford health care service, and although there has been significant

expansion of the Medicaid program, there remain a number of gaps in providing adequate family planning services for this population as well (Gold 2007), with immigrants particularly unlikely to have health insurance.

Data and methods

Data

This analysis uses data collected by The National Campaign to Prevent Teen and Unplanned Pregnancy in collaboration with the Guttmacher Institute, the 2009 Survey of Unmarried Young Adults' Contraceptive Knowledge and Practices (see Kaye, Suellentrop, and Sloup 2009), which surveyed unmarried men and women aged 18-29. A dual frame sample was designed for this telephone-based survey containing three components: (1) a random digit dial sample of landline telephone numbers, (2) a targeted sample of listed telephone numbers with an increased probability of having an eligible respondent, and (3) a random sample of cell phone numbers. The two landline samples were over-sampled for Hispanics and non-Hispanic blacks. Respondents gave no identifying information other than that needed to identify eligibility (marital status and age) and basic sociodemographic indicators (race-ethnicity and gender) and were assured their responses would remain confidential and anonymous. When weighted to account for the survey design, the data are nationally representative of unmarried young adults aged 18-29 in 2009. The sample includes 897 women and 903 men for a total of 1,800 respondents.

Dependent Variables

Our dependent variables in this analysis are three measures of sexual literacy: pregnancy risk knowledge, pregnancy fatalism, and contraceptive side effects. Looking first at pregnancy

risk knowledge, there were six possible questions regarding pregnancy and reproduction. Here, we analyze five questions (correct answers to these questions are in *italics*):

1) During a woman's monthly cycle, are there certain days when she is more likely to become pregnant? *Yes*/No
2) After giving birth, a woman can get pregnant before her first period. *True*/False
3) Douching after sex can prevent pregnancy. True/*False*
4) A woman who is breastfeeding cannot get pregnant. True/*False*
5) Pregnancy is much less likely to occur if a couple has sex standing up. True/*False*

The remaining true/false question asked "The only way to completely prevent pregnancy is by not having sex." We excluded this question due to concerns that it may tap into the respondents' knowledge of contraceptive methods and efficacy. We summed incorrect responses to create a numeric indicator, ranging from 0-5, of how many pregnancy risk misperceptions the respondent reported. 195 respondents did not give valid answers to one or more of these questions (answering "don't know" or "refused"), reducing the sample size to 1,605.

Pregnancy fatalism is measured by the response to the statement, "It doesn't matter whether you use birth control or not; when it is your time to get pregnant, it will happen," measured on a five-category scale of strongly agree to strongly disagree. We dichotomized this variable into strongly agree/agree or not. Four respondents are excluded due to an invalid response, bringing the sample size to 1,601.

Hormonal contraceptive side effects are measured with the responses to three questions, all answered on a scale of 1 (not likely) to 4 (extremely likely):

1) How likely is it that the birth control pill or other hormonal methods would reduce sexual desire?

2) How likely is it that the birth control pill or other hormonal methods would cause severe mood swings?
3) How likely is it that using the birth control pill or other hormonal methods for many years would cause a serious health problem, like cancer?

For the contraceptive side effects question, we recoded these dichotomously to examine the proportion who reported it was quite or extremely likely to experience the specific side effect. In exploratory analyses, we tested different approaches to combining these variables, but found that they displayed different distributions; as such, we analyze each measure separately. An additional 92 cases did not have valid responses for these questions (only individuals who responded affirmatively to earlier questions regarding awareness of hormonal methods were asked these questions). This produces a sample size of 1,508 men and women with valid answers across all three measures.

Independent Variables

The key independent variable is race-ethnicity-nativity, categorized as non-Hispanic white, non-Hispanic black, foreign-born Hispanic, native-born Hispanic, or Asian/other. We disaggregate Hispanic respondents by nativity based on previous research finding substantial differences in family and reproductive behavior between native-born and foreign-born Hispanics. All models control for age and gender, as these characteristics vary significantly by race-ethnicity-nativity in the sample (not shown).

Full models control for variables associated with reproductive health knowledge and attitudes. We include direct sources of information about reproductive health: whether the respondent ever had sex education, whether the respondent had ever visited a doctor or clinic for sexual health services, and the respondent's most trusted and most common sources of

information; 60 cases were missing information on sources of information. Possible sources of information provided in the survey include friends, partner, family, teachers, internet, books/ magazines/pamphlets, or TV/radio. We explored several ways of characterizing sources of information; based on the results of these analyses, we created two dichotomous measures: whether the respondent reported that the source he or she trusted most for "accurate information regarding contraception and birth control" was a doctor/nurse or not, and whether the source from which he or she "received the most information in the past 12 months" was either friends, current/past partner, or siblings/other relatives (other than parents) or not. These dichotomous variables represent the accuracy of information (was the most trusted source a health professional or not) and the degree of influence of friends, family, partners, etc.

The respondents' own sexual behaviors and attitudes are also covariates. These include whether the respondent is currently in a sexual union (missing for 4 cases), age at first sex (less than 15, 15-17, 18 or older, or never had sex), has children or been pregnant/impregnated someone, and family and friends' attitudes toward sex and pregnancy (family does not approve of nonmarital childbearing, friends have had unplanned pregnancies, and friends believe birth control is important) as well as religiosity (never attends services, attends a few times year/1-3 times a month, attends weekly or more). Additional explanatory variables include measures of socioeconomic status, measured as education (less than high school, high school, some college, college or more), employment status (not working or in school, in school, working and in school, working; missing for 3 cases), and insurance status (Medicaid, private, uninsured). The final sample size is 1,441 cases.

Analytical Approach

We first present weighted descriptive statistics for the analytic sample, then present weighted bivariate statistics of our dependent variables by race-ethnicity. Logistic regression is

used to analyze the dichotomous dependent variables ("birth control doesn't matter when it's your time" and the side effects measures), and we use Poisson regression to analyze the number of pregnancy risk misperceptions (ranging from 0-5) because this measure was sharply skewed toward 0 (results using OLS regression were substantively similar). We show two sets of models – a baseline model which includes only race-ethnicity, age, and gender, and a full model with sources of information, sexual/family beliefs and behaviors, and socioeconomic characteristics. We also estimated models adding these groups of covariates separately but, for brevity's sake, do not present these models; we briefly discuss results from these models where relevant, and full results from these models are available from the authors on request. In exploratory analysis, we tested for differences in results for models run separately by gender, age group, and parents vs. nonparents, but the variation was minimal and the small sizes of the disaggregated samples reduced confidence in the results; as such, we do not present these models here.

Results

Descriptive Results

Table 1 displays the descriptive results for the analytic sample. The sample is about 61% non-Hispanic white, 16% non-Hispanic black, 6% foreign-born Hispanic, 10% native-born Hispanic, and 6% Asian/other. A fourth of the sample is 18-19 years old, and a third of the sample is 25-29, with the remainder aged 20-24 years old. Just under half of the sample is female. However, both the age and gender distribution vary significantly across race-ethnic groups as a result of both population-level differences and differential non-response (not shown). There is socioeconomic variation in the sample. Just under a fifth of the sample has less than a high school education, and a similar proportion has a college degree or more. Thirteen percent of the analytic sample is neither working nor enrolled in school. About a quarter are uninsured, with slightly more than half having private insurance and slightly more than a fifth having Medicaid.

- Table 1 here -

Turning to sexual and family beliefs and behaviors, the majority of the analytic sample has had sex, with the modal age at first sex occurring between ages 15-17. Just over half are currently in a sexual relationship, and 29% have been pregnant/impregnated someone. 42% report that their family does not approve of nonmarital childbearing. The majority (85%) report that their friends think birth control is important even though a substantial minority (36%) have friends who have had an unplanned pregnancy. Attendance at religious services is fairly common – the majority of the sample attends services with some frequency, with 43% attending weekly or more. The last few rows of Table 1 show information on sources of sexual information. 80% of the sample had a class on sex education at some point. About 60% had seen a doctor for sexual health reasons. Just under a third of the sample (31%) named a non-health care professional as their most trusted source for accurate information on contraception and birth control, and a fourth of the sample (26%) reported that they got most of their information in the past year from friends, a current/past partner, or siblings/other relatives.

The weighted bivariate distribution of the dependent variables by race-ethnicity is shown in Table 2, with the overall distribution indicated in the first row. Two things are readily apparent from this table. One, there is a fair amount of pregnancy risk misperception, pregnancy fatalism, and concern about side effects among unmarried young adults of all race-ethnic groups. For instance, 40% believe that birth control does not matter because when it is "your time" to get pregnant, it will happen. The average number of pregnancy risk misperceptions is 0.7. In disaggregated analyses, inaccurate beliefs about pregnancy following childbirth are most common, with one-fourth believing that a woman cannot get pregnant before menstruation resumes. Over 40% believe that hormonal birth control can cause severe mood swings. About

15% believe that hormonal methods reduce sexual desire, while 20% believe they can lead to cancer.

- Table 2 here -

Two, there appear to be substantial differences by race-ethnicity in reproductive health knowledge and beliefs about contraceptive side effects. Foreign-born Hispanics report a significantly higher average number of pregnancy risk misperceptions than any other race-ethnic group. A significantly lower proportion of non-Hispanic whites (34%) believe that birth control does not matter when it is "your time" to get pregnant compared to non-Hispanic blacks (51%) and foreign-born Hispanics (53%). Looking at side effects, a significantly higher proportion of non-Hispanic blacks (23%) than non-Hispanic whites (13%) believe that reduced sexual desire is quite or extremely likely with hormonal birth control. More non-Hispanic blacks (26%) believe that it is likely that hormonal birth control causes serious health problems like cancer than non-Hispanic whites (18%). At the bivariate level, more non-Hispanic blacks (51%) believe that hormonal contraceptives cause severe mood swings than non-Hispanic whites (42%); the difference between foreign-born Hispanics (50%) and non-Hispanic whites just misses statistical significance (p=.058).

Multivariate Results

We turn to regression models to more fully parse out race-ethnic differences in misperceptions and beliefs. Table 3 displays the baseline results, with controls only for age and gender (the distribution of which differ across race-ethnic groups in the full sample). In the first model examining pregnancy risk misperceptions (Model 1), foreign-born Hispanics are significantly more likely than non-Hispanic whites to hold erroneous beliefs about the risk of pregnancy, but there are no other differences between non-Hispanic whites and other race-ethnic

groups. For the measure of pregnancy fatalism shown in Model 2, the odds of believing that birth control does not matter because when it's "your time" to get pregnant, it will happen are over twice as high for non-Hispanic blacks and foreign-born Hispanics than for non-Hispanic whites (OR=2.07 and OR=2.38, respectively). Looking at side effects (Models 3-5), non-Hispanic blacks appear to be particularly concerned about side effects. Compared to non-Hispanic whites, non-Hispanic blacks have odds over 2.1 times as high of believing that hormonal contraceptives reduce sexual desire, 1.5 times as high of believing they cause severe mood swings, and 1.7 times as high of believing they can cause serious health problems, like cancer.

Overall, these results do suggest that there are race-ethnic differences in sexual literacy that may ultimately affect contraceptive use, though these vary across groups, with foreign-born Hispanics having a less accurate understanding of the reproductive process and non-Hispanic blacks believing in greater chances of adverse side effects than non-Hispanic whites. Pregnancy fatalism seems more common for foreign-born Hispanics and non-Hispanic blacks. As would be expected, women report a lower average number of pregnancy misperceptions than men; they are also less likely to believe that hormonal contraceptives cause severe mood swings. Teenagers have odds about twice as high as individuals in their early twenties of having a fatalistic view about pregnancy.

- Table 3 here –

The race-ethnic differences in misperceptions, pregnancy fatalism, and hormonal contraceptive side effects may result from differences in socioeconomic status, sexual/fertility experiences and beliefs, or sources of information. To examine whether these factors are associated with race-ethnic variation, we ran multivariate models, as shown in Table 4. We

estimated a series of models, adding in socioeconomic characteristics, sexual/fertility experiences and beliefs, and sources of information separately before putting them all in the same model, but for the sake of brevity, we show only the full model and discuss the results from intermediate models when appropriate. Model 1 displays the results predicting pregnancy risk misperceptions with a full set of covariates. In contrast to the unconditional model, foreign-born Hispanics no longer significantly differ from non-Hispanic whites. The intermediate models demonstrated that the significant difference between foreign-born Hispanics and non-Hispanic whites disappear when accounting for socioeconomic characteristics, namely insurance status. Foreign-born Hispanics are more likely to be uninsured, and uninsured individuals hold more inaccurate beliefs regarding the reproductive process relative to those with private insurance. Looking at the other covariates, women have fewer inaccurate beliefs than men, as do those with some college education relative to those with just a high school degree. Relative to working young adults, those enrolled in school and not concurrently working report a greater number of pregnancy risk misperceptions, as do those who never attend religious services compared to those who attend a few times a month. Sources of information matter somewhat; individuals who say their most trusted source of information is someone other than a health care professional and those who get more of their information from peers have more misperceptions than those who get most information from other sources. However, intermediate models containing only baseline variables and sources of information show that information sources do not mediate race-ethnic differences.

- Table 4 here –

In Model 2, looking at the measure of pregnancy fatalism, race-ethnicity is no longer a strongly significant predictor, though the coefficient for foreign-born Hispanics approaches

significance (p=.066). The lack of significance is due largely to the inclusion of sexual/fertility experiences and friends' beliefs, with socioeconomic characteristics also reducing the association between race-ethnicity and pregnancy fatalism. Having friends who think birth control is important is significant, reducing the odds of believing that birth control does not matter by about one-third relative to those who do not have friends who think birth control is important. Religiosity also matters, with individuals who attend religious services weekly or more having odds of agreeing with this statement 1.8 times higher than those who attend services a 1-3 times a month. In the model with just race-ethnic variables and socioeconomic status, being on Medicaid is significantly associated with fatalism (increasing the likelihood of believing that birth control does not matter), and including this measure reduces, but does not eliminate, the association between race-ethnicity and fatalism; however, Medicaid status is not significant in the full model presented in Table 4.

In the unconditional models for side effects, non-Hispanic blacks were more likely than whites to believe that hormonal contraceptives caused problems such as reduced sexual desire, mood swings, and serious health problems, and differences remain between non-Hispanic blacks and whites in the full model as well for two of the three potential side effects (Models 3-5). In Model 3, non-Hispanic blacks are more likely to believe that hormonal contraceptives reduce sexual desire in both the unconditional and full models, though the magnitude of the odds ratio declines slightly from about 2.1 to 1.8. Education is associated with belief about sexual desire, with those who have less than a high school degree having odds of believing that hormonal contraceptives reduce sexual desire that are twice as high as those with a high school education. Individuals who had never had sex have 2.3 times as likely to believe that hormonal

contraceptives reduce sexual desire as those who had their first sexual encounter between ages 15-17.

In Model 4, examining the likelihood of believing in severe mood swings, the beliefs of non-Hispanic blacks are no longer statistically different from those of non-Hispanic whites. Intermediate models (not shown) suggest that this attenuation is largely attributable to the incorporation of insurance status. Although the association between insurance status and beliefs in mood swings is not statistically significant in the full model, being uninsured is positively and significantly associated with belief in mood swings relative to having private insurance in models that control only for socioeconomic characteristics.. Sexual experience and friends' experience are also associated with beliefs about mood swings. Individuals who have never had sex have odds nearly 50% lower of believing that hormonal contraceptives lead to mood swings than those who had first had sex at ages 15-17, and having friends who have had an unplanned pregnancy reduces the likelihood as well (OR=.67). In the full model, one measure of sources of information is statistically significant and works in the expected direction – individuals who have seen a health care professional for sexual health reasons have odds about 40% lower of believing that severe mood swings are a likely side effect of hormonal contraceptives than those who have not seen a health care professional for such reasons. Interestingly, though, this measure is not significant in the model with only race-ethnicity and sources of information (and non-Hispanic blacks remain more likely to believe in mood swings); this factor largely seems to work through insurance status (not shown).

The belief that serious health problems such as cancer are quite or extremely likely side effects of hormonal contraceptives remains significantly different between non-Hispanic blacks and whites in the full model; in fact, the odds ratio even increases slightly from 1.72 to 1.78. As

can be seen in Table 4, none of the socioeconomic characteristics, sexual/fertility experiences and beliefs, or sources of information account for the higher likelihood among non-Hispanic blacks. In the intermediate models, having had a past pregnancy is statistically significant, reducing the odds of believing in serious health problems by about 40%, but it did not mediate differences between non-Hispanic blacks and non-Hispanic whites and is not statistically different from zero in the full model.

In sum, there is race-ethnic variation in pregnancy risk misperceptions, pregnancy fatalism, and beliefs about side effects, but race-ethnic groups differ across these measures. Further, differences between non-Hispanic whites and other groups were attenuated in multivariate models for pregnancy risk knowledge and pregnancy fatalism, but differences in beliefs about side effects remained between non-Hispanic whites and blacks.

Discussion

Unintended fertility is considered a public health concern in the United States, and the stark disparities in rates of unintended fertility across race-ethnic groups may further exacerbate other race-ethnic differences in health and well-being. Qualitative research on disadvantaged minority groups and teenagers points to low sexual literacy among some race-ethnic groups as a possible source of high unintended birth rates, but much of this research focuses on particular subgroups and does not include a racially diverse sample. Further, if there are differences in knowledge and beliefs, the factors behind such differences have not been identified. This article builds upon prior work, using a nationally representative sample of unmarried young adults to examine whether sexual literacy varies across race-ethnic groups. Our study examined pregnancy risk knowledge, fatalistic views about pregnancy, and beliefs about contraceptive side effects in a diverse sample of unmarried adults aged 18-29, paying special attention to factors that may

contribute to variation, namely socioeconomic differences, sexual experiences and beliefs, and sources of sexual health and contraceptive information.

Our results show that at the bivariate level, disadvantaged minority groups do have lower sexual literacy than non-Hispanic whites, but race-ethnic differences vary across different components of sexual literacy. Foreign-born Hispanics report more pregnancy risk misperceptions than any other race-ethnic group. Non-Hispanic blacks are more likely than whites to report a high chance of reduced sexual desire, severe mood swings, and serious health problems such as cancer from hormonal contraceptives. Non-Hispanic blacks and foreign-born Hispanics are more likely than non-Hispanic whites to believe that birth control use does not matter when it is one's "time" to get pregnant.

Race-ethnic differences, however, are not statistically different from zero in multivariate models for pregnancy risk knowledge or pregnancy fatalism. We had hypothesized that any differences in sexual literacy would be attributable, at least in part, to differences in sources of sexual health knowledge. However, this was not the case, as sources of health knowledge were rarely significantly associated with the dependent variables, and in the two instances in which sources did predict sexual health knowledge, they did not mediate race-ethnic differences. Instead, we found that socioeconomic factors, namely insurance status, were associated with pregnancy misperceptions, with uninsured individuals holding more misperceptions, and the greater proportion of foreign-born Hispanics with erroneous beliefs about the risk of pregnancy was largely due to the higher proportion of uninsured foreign-born Hispanics. The lack of insurance may be functioning as a proxy for poverty or income status, which was not included in the survey. Those whose most trusted source of information was a non-health care professional, though, did report more misperceptions. For pregnancy fatalism, race-ethnic differences were

not statistically significant in the full model, but there was no singular factor, or group of factors, that were strongly associated with fatalism. Individuals on Medicaid and those who attended religious services weekly or more (relative to those who attended only a few times a month) were more likely to hold fatalistic views about pregnancy, while those whose friends thought birth control was important were less likely to have such beliefs.

With the exception of mood swings, we were unable to account for the greater belief among non-Hispanic blacks relative to non-Hispanic whites that hormonal contraceptives were highly likely lead to negative side effects. While the chances of major problems are quite low, there is research documenting links between hormonal contraceptives, sexual desire, and adverse health effects. For instance, some studies have found decreased libido among hormonal contraceptive users, though others have found no effect, and still others have found increased libido (Burrows, Basha, and Goldstein 2012). Non-Hispanic black women tend to view their own sexuality more positively than non-Hispanic whites (Bancroft, Long, and McCabe 2011), so they may weigh concerns over reduced sexual desire more heavily. Similarly, hormonal contraceptives have been linked to serious problems such as stroke and heart attacks, though these risks are very low overall and are much reduced relative to earlier versions of the pill; further, serious problems rarely occur among those who do not have other risk factors (such as smoking or hypertension) (Chadwick, Burkman, Tornesi, and Madaheven 2012). The evidence on a link between hormonal contraceptives, particularly oral contraceptives, and cancer is mixed – the pill protects against uterine and endometrial cancer, but it is less clear how breast cancer risk is affected. While some large-scale studies find no evidence of a breast cancer-pill link (e.g., Marchbanks et al. 2002), one study of non-Hispanic blacks found a statistically significant but slight increase in a rare but aggressive form of breast cancer (Rosenberg et al. 2010). Thus, non-

Hispanic black women may be drastically overestimating the risks of side effects when using contraception, but their fears are not necessarily unfounded. Previous research on a variety of issues related to health knowledge and health care utilization shows a broad pattern of generalized medical distrust among non-Hispanic blacks, with particular concerns related to sexual and reproductive health interventions, stemming from a history of deceit and mistreatment of non-Hispanic blacks by the medical establishment (e.g., Boulware et al. 2003; Dovidio et al. 2007; Gamble 1997; Thorburn and Bogart 2005). Beliefs about the side effects associated with hormonal contraception may be part of this larger pattern of distrust of the health system.

Limitations

Our study has several limitations. First, although we discuss factors that have been suggested as an explanation for high rates of unintended fertility among race-ethnic minorities (Dehlendorf et al. 2010), we do not directly link them to contraceptive use and fertility behaviors, though other work has shown a link between inaccurate contraceptive knowledge and unprotected sex (Frost, Lindberg, and Finer 2012). Second, there are other factors, both psychosocial (such as motivation to avoid a pregnancy) and structural (such as health care access), that likely play a role in unintended fertility, and we do not include those factors in the current analyses. Third, although we have a rich set of explanatory variables, these variables are not perfect and are certainly not complete. Finally, our sources of information measures may not adequately capture what is learned from these sources or the accuracy of the information. It is also worth noting that small sample sizes prevented us from disaggregating the Asian/other category analytically (though basic descriptives, not shown, revealed that this group was 55% Asian and 45% other) and from disaggregating non-Hispanic groups by nativity.

Conclusion

High rates of unintended pregnancy in the United States, especially among non-Hispanic blacks and Hispanics, continue to be a public health concern. Previous research had showed that minority women often had misperceptions about pregnancy risk and concerns about side effects, but it was not clear whether minorities overall had substantially more misperceptions and concerns than whites. Our analysis suggests that there are, indeed, differences in sexual literacy across race-ethnic groups, but these differences are not uniform or universal. In general, there are minimal differences between native-born Hispanics, non-Hispanic whites, and those classified as "Asian/other" in our dataset. Foreign-born Hispanics have relatively high levels of misunderstanding about the reproductive process, whereas non-Hispanic blacks are more likely to believe that the risk of side effects – including serious health problems – is high when using hormonal contraceptives relative to non-Hispanic whites. However, the differences in sexual literacy between non-Hispanic whites and foreign-born Hispanics can largely be attributed to social position, downplaying the idea that cultural differences explain differences in sexual and fertility behavior. Differences between non-Hispanic blacks and non-Hispanic whites perhaps reflect distrust of medical system among non-Hispanic blacks, as our models were able to account for the race-ethnic differences in pregnancy fatalism but not concern over side effects. To the extent that concern over these side effects influences contraceptive behavior, usage of highly effective hormonal methods among non-Hispanic blacks may lag behind usage among non-Hispanic white women, and reducing race-ethnic differences in unintended fertility will remain a challenge.

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Table 1. Weighted Descriptive Statistics for the Analytical Sample

Race-ethnicity		
	Non-Hispanic white	61.3%
	Non-Hispanic black	16.1%
	Foreign-born Hispanic	5.9%
	Native-born Hispanic	10.5%
	Asian/other	6.3%
Age		
	18-19	26.4%
	20-24	41.9%
	25-29	31.8%
Female		46.4%
Socioeconomic characteristics		
Education		
	Less than high school	18.5%
	High school/GED	26.4%
	Some college	37.0%
	College or more	18.1%
Employment & enrollment		
	Not working or in school	13.1%
	In school	25.7%
	Working and in school	18.4%
	Working	43.8%
Insurance		
	Medicaid	21.9%
	Private insurance	53.9%
	Uninsured	24.2%
Sexual/family beliefs and behaviors		
Age at first sex		
	Before 15	17.9%
	15-17	42.2%
	18 or later	26.1%
	Never had sex	13.7%
Currently in a sexual relationship		56.5%
Ever been pregnant		28.8%
Family does not approve of nonmarital childbearing		42.0%
Friends think birth control is important		85.0%
Friends have had unplanned pregnancies		35.5%
Religiosity		
	Never attends services	34.8%
	Attends monthly/few times a month	41.6%
	Attends weekly or more	23.6%
Sources of information		
Had sex education class		81.1%
Has seen a doctor for sexual health reasons		61.0%
Most trusted source is a not a health care professional		30.6%
Gets most of information from peers/siblings/partner		25.8%
N		1441

Table 2. Bivariate Associations between Race-Ethnicity and Pregnancy Risk Misperceptions, Pregnancy Fatalism, and Beliefs about Contraceptive Side Effects

					Side Effects					
	Average number of misperceptions regarding pregnancy (range 0-5)		Believe birth control use does not matter; when it is your time to get pregnant, it will happen		Reduced sexual desire		Severe mood swings		Serious health problems, like cancer	
Full analytical sample	0.70		39.7%		14.8%		44.9%		19.8%	
Race/ethnicity										
Non-Hispanic white	0.68	[c]	33.8%	[b,c,d]	12.4%	[b]	41.5%	[b]	17.6%	[b]
Non-Hispanic black	0.58	[c]	51.8%	[a]	23.2%	[a]	50.5%	[a]	26.7%	[a]
Foreign-born Hispanic	1.19	[a,b,d]	53.1%	[a]	11.1%		50.0%		26.1%	
Native-born Hispanic	0.74	[c]	44.7%		16.1%		51.3%		18.6%	
Asian/other	0.73		45.0%	[a]	14.7%		46.7%		19.4%	

[a] Differs from non-Hispanic whites at p≤.05

[b] Differs from non-Hispanic blacks at p≤.05

[c] Differs from foreign-born Hispanics at p≤.05

[d] Differs from native-born Hispanics at p≤.05

[e] Differs from Asian/others at p≤.05

Table 3. Unconditional Models Predicting Pregnancy Risk Misperceptions, Pregnancy Fatalism, and Beliefs about Contraceptive Side Effects (with controls for age and gender)

							Side Effects (Logistic regression)					
	Number of Inaccurate Beliefs about Getting Pregnant (Poisson regression)			Believe that BC doesn't matter when it's "your time" to get pregnant, you will (Logistic regression)			Reduced sexual desire		Severe mood swings		Serious health problems, like cancer	
	β	se		exp β			exp β		exp β		exp β	
Race/ethnicity												
Non-Hispanic white	--			--			--		--		--	
Non-Hispanic black	-0.06	0.14		2.08	***		2.10	*	1.54	*	1.72	*
Foreign-born Hispanic	0.55	0.18	** [a]	2.38	**		0.91	[b]	1.40		1.87	
Native-born Hispanic	0.05	0.15		1.53			1.34		1.43		0.99	
Asian/other	0.09	0.17		1.72			1.25		1.21		1.11	
Age												
18-19	0.18	0.11		1.93	***		1.34		0.94		1.27	
20-24	--			--			--		--		--	
25-29	-0.12	0.16		1.10			1.04		0.79		0.62	†
Female	-0.54	0.12	***	1.19			1.12		0.70	*	1.12	
Constant	-0.20	0.10	¥	0.38	***		0.12	***	0.92		0.22	***
N	1441											

¥p≤.06 *p≤.05 **p≤.01 ***p≤.001

Table 4. Full Models Predicting Pregnancy Risk Misperceptions, Pregnancy Fatalism, and Beliefs about Contraception Side Effects

	Model 1. Number of Inaccurate Beliefs about Getting Pregnant (Poisson regression)			Model 2. Believe that BC doesn't matter when it's "your time" to get pregnant, you will (Logistic regression)		Side Effects (Logistic regression)					
						Model 4. Reduced sexual desire		Model 5. Severe mood swings		Model 6. Serious health problems, like cancer	
	β	se		exp β		exp β		exp β		exp β	
Race-ethnicity											
Non-Hispanic white	--			--		--		--		--	
Non-Hispanic black	-0.21	0.14		1.45		1.84	*	1.16		1.78	*
Foreign-born Hispanic	0.28	0.17		1.97		0.53		0.99		1.36	
Native-born Hispanic	-0.04	0.15		1.19		1.16		1.23		0.94	
Asian/other	-0.00	0.15		1.73		1.17		1.37		1.12	
Age											
18-19	-0.01	0.11		1.67	*	1.05		0.89		1.28	
20-24	--			--		--		--		--	
25-29	-0.10	0.14		1.-0		1.25		0.75		0.64	
Female	-0.38	0.12	**	1.08		1.28		0.93		1.39	
Socioeconomic characteristics											
Education											
Less than high school	0.12	0.12		0.94		2.05	¥	1.22		1.24	
High school/GED	--			--		--		--		--	
Some college	-0.30	0.12	*	0.76		0.86		0.95		1.04	
College or more	-0.20	0.19		0.59		0.96		0.94		1.09	
Employment & enrollment											
Not working or in school	0.07	0.19		1.15		1.01		1.05		0.54	
In school	0.32	0.12	**	1.18		0.93		0.72		0.71	
Working and in school	0.11	0.14		1.00		0.98		1.03		1.01	
Working	--			--		--		--		--	
Insurance											
Medicaid	0.24	0.16		1.53		0.81		1.39		1.05	
Private insurance	--			--		--		--		--	
Uninsured	0.41	0.11	***	1.00		1.43		1.46		1.55	
Sexual/family beliefs and behaviors											
Age at first sex											
Before 15	0.12	0.13		0.94	**	1.69		1.08		1.36	
15-17	--			--		--		--		--	
18 or later	0.22	0.13		1.09		0.80		0.92		1.06	
Never had sex	-0.11	0.17		0.90		2.29	*	0.54	*	1.01	

Currently in a sexual relationship	-0.02	0.11		1.08		1.38		0.95		0.95		
Ever been pregnant	-0.11	0.14		1.24		0.68		0.87		0.65		
Family does not approve of nonmarital childbearing	-0.17	0.09		1.11		1.33		0.98		0.89		
Friends think birth control is important	0.06	0.12		0.64	*	0.98		0.83		1.12		
Friends have had unplanned pregnancies	-0.11	0.10		0.86		0.83		0.67	*	0.73		
Religiosity												
Never attends services	0.21	0.11	¥	0.84		1.32		0.97		1.25		
Attends monthly/few times a month	--			--		--		--		--		
Attends weekly or more	0.08	0.11		1.78	**	1.42		1.30		1.05		
Sources of information												
Had sex education class	-0.14	0.11		0.77		0.68		0.90		1.02		
Has seen a doctor for sexual health reasons	-0.14	0.12		1.11		1.03		0.60	*	0.74		
Most trusted source not a health care professional	0.25	0.09	**	1.20		0.95		1.12		1.03		
Gets most information from peers/siblings/partner	0.21	0.10	*	1.10		1.11		1.26		0.75		
Constant	-0.40	0.22		0.62		0.09	***	1.67		0.24	**	
N	1441											

¥p≤.06 *p≤.05 **p≤.01 ***p≤.001